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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/025,731	12/26/2001	Ferdinand K. Besik		1849

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EXAMINER

DUONG, THO V

ART UNIT

PAPER NUMBER

3743

DATE MAILED: 12/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/025,731

Applicant(s)

BESIK, FERDINAND K.

Examiner

Tho v Duong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claimed subject matter of "an extended outer wall surface" must be shown or the feature(s) canceled from claims 3,5,9 and 13. No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

Claims 8, 10,12 and 14 are objected to because of the following informalities: the limitation of "ful cone" appears to be a typographical error of "full cone". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,2,6,7 and 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bell, Jr. et. al. (US 4,183,401) in view of J. G. Baker (US 206,998). Bell discloses (figures 1 and column 1, lines 19-23 and column 2, line 60-column 3, line13) an evaporator comprising a shell

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(12) having shell headers (24,26) for a first and second ends of the shell; an inlet (18) and an outlet (20) for a second fluid which is a liquid; a plurality of metal heat exchange tube means (16) positioned within the shell and having opened intake ends for receiving a first fluid, which is a liquid, flowing through the tube to be evaporated and having opened outlet end for discharging the first fluid; a first fluid inlet means (22) being in fluid communication with the first inlet ends of the tubes; and a first fluid outlet (23) in fluid communication with the outlet ends of the tubes. Bell does not disclose a baffle means inserted into the heat exchanger tube. Baker discloses (figures 1,3,4 and column 2, third paragraph) that a heat exchanger that has a baffle means (B) inserted into a tube A having a smooth inner and outer surface, wherein the baffle (A) having a diameter substantially equal to the internal diameter of the tube, separating the circular channel of the tube into two semi-circularly sectioned spiral channels extending along the length of the tube to provide rotating spiraling flow of a fluid so that the fluid in liquid state is forced against the heated inner surface of the tube and allow the vapors flowing through the center of the tube in order to enhance the heat transfer efficiency of the heat exchanger. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use Baker's teaching in Bell's evaporator to enhance the heat transfer efficiency of the heat exchanger. Regarding claims 16-19, the limitations of material being used as for the first fluid and the second fluid was not given any structural patentable weight, since "a recitation with respect to the material intended to be worked upon by a claimed apparatus does not impose any structural limitation upon the claimed apparatus which differentiates it from a prior art apparatus satisfying the structural limitation of that claimed" stated in Ex parte Masham.

Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bell and Baker as applied to claims 1 and 6 above, and further in view of Kojima (US 5,104,233). Bell and Baker substantially disclose all of applicant's claimed invention except for the limitation that a porous sintered metal is coated on an inner surface of the tube. Kojima discloses (figures 1 and 3) a heat exchanger tube having a porous sintered metal (15) coated on the inner surface of the tube to increase the surface areas of the tube to the fluid. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use Kojima's teaching in the combination device of Bell and Baker to increase the surface areas of the tube to the fluid.

Claims 3,5,9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bell, Baker and Kojima as applied to claims 1 and 6 above, and further in view of Lu (US 4,434,846). Bell, Baker and Kojima substantially disclose all of applicant's claimed invention as discussed above except for the limitation of an extended outer wall surface of the tube. Lu discloses a shell and tube type heat exchanger comprising a shell (11) for conveying a first fluid, a plurality of tubes (30) for conveying a second fluid wherein the tubes further has a plurality of fins (50) extended from the outer surface of the tube to increase the heat transfer surface areas of the first fluid to the second fluid. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use Lu's teaching in the combination device of Baker, Kojima and Lu to increase the heat transfer surface areas of the first fluid to the second fluid.

Claims 8, 10,12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bell, Baker, Kojima and Lu as applied to claims 6,9 and 13 above, and further in view of Boucher et al. (US 5,955,135). Bell, Baker, Kojima and Lu substantially disclose all of applicant's claimed invention except for the limitation of a spray nozzle in a full cone spray.

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Boucher teaches (figures 2 and 8) about using a full cone spray nozzle (34) as an inlet means of an evaporative chamber to produce small droplets form of a liquid to increase the evaporation potential of the liquid. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use Boucher's teaching of a full cone spray nozzle in the combination devices of Bell, Baker, Kojima and Lu to produce small droplets form of a liquid into an evaporative chamber to increase the evaporation potential of the liquid.

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yasuda (US 5,307,867) discloses a heat exchanger that has spiral baffles inserted into a tube.

R. W. Miller (US 2,602,647) discloses a tubular contactor with conical distribution plate.

Cadars (US 4,700,749) discloses swirl-generating helical agitator for heat exchanger tubes.

Mitsumoto et al. (US 6,382,313) discloses an evaporator that has a cone shaped nozzle and a plurality tube extending within a shell.

Gorman (US 4,641,705) discloses a heat exchanger that has a helical shaped blade and pin shape support members disposed within a tube.

J. Kemnal (US 1,770,208) discloses a heat exchanger that has a spiral baffle disposed within the tube to generate a centrifugal force to the working fluid.

Heller et al. (US 4,265,275) discloses an internal fin tube heat exchanger.

Brandin et al. (US 3,795,259) discloses a device for evenly mixing and distributing a gas and liquid mixture.

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Any inquiry concerning this communication or earlier communication from the examiner should be directed to Tho Duong whose telephone number is (703) 305-0768. The examiner can normally be reached on from 9:30-6 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Bennet, can be reached on (703) 308-0101. The fax phone number for the organization where this application or proceeding is assigned is (703)308-7764.

Any inquiry of a general nature or relating to status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0861.

Tho Duong

December 12, 2002



Henry Bennett  
Supervisor Patent Examiner  
Group 3700